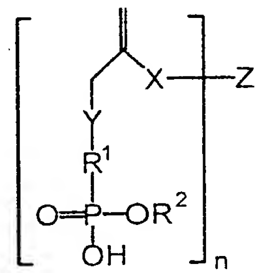
Claims

1. Acrylophosphonic acid of the general formula (I), stereoisomers thereof or mixtures of these



(I)

in which R^1, R^2, R^3, X, Y, Z and n have the following meanings:

R^1 = a linear or branched C_1 to C_{10} alkylene or C_6 to C_{14} arylene radical;
R^2 = hydrogen, a linear or branched C_1 to C_{10} alkyl or C_6 to C_{10} aryl radical;
Y = oxygen, sulphur, C_1 to C_8 alkylene or is absent;
n = 1, 2, 3, 4 or 5;

where

X = CN, n = 1 and Z = is absent or
X = $CONR^3$ with
R^3 = hydrogen, a linear or branched C_1 to C_{10} alkyl radical, or a C_6 to C_{10} aryl radical;

provided that

for n = 1
Z = hydrogen or a linear or branched C_1 to C_{10} alkyl radical, or a phenyl radical; and
for n = 2 to 5
Z = an aliphatic, aromatic, or araliphatic, linear or branched hydrocarbon radical with 1 to 14 carbon atoms, substituted n times with the structure of formula (I) in

brackets, where Z and R^3 may also be part of a common ring, and where

the individual radicals may be substituted or unsubstituted.

Sub A3

2. Acrylophosphonic acid according to claim 1, **characterized in that** the variables of formula (I) have the following meanings independently of each other:

R^1 = a linear or branched C_1 to C_5 alkylene radical or phenylene;
R^2 = hydrogen or a linear C_1 to C_3 alkyl radical;
Y = oxygen or is absent;
X = CN or $CONR^3$ with
R^3 = hydrogen, a linear C_1 to C_6 alkyl radical, a phenyl radical or together with Z part of a six-membered ring;
n = 1 or 2; and
Z = hydrogen or a linear or branched C_1 to C_{10} alkyl radical, a phenyl radical or together with R^3 part of a six-membered ring (for n = 1); or
Z = a linear C_1 to C_{10} alkylene radical or together with R^3 part of a six-membered ring (for n = 2).

3. Acrylophosphonic acid according to claim 2, **characterized in that** the variables of formula (I) have the following meanings independently of each other:

R^1 = a linear C_1 to C_4 alkylene radical;
R^2 = hydrogen or a methyl radical;
Y = oxygen;
X = $CONR^3$;
R^3 = hydrogen or a linear C_1 to C_5 alkyl radical; and
Z = hydrogen or a linear C_1 to C_6 alkyl radical (for n = 1); or
Z = a linear C_1 to C_5 alkylene radical (for n = 2).

Sub A3)

4. Acrylophosphonic acid according to one of claims 1 to 3, **characterized in that** the radicals R^1, R^2, R^3 and/or Y are unsubstituted.

5. Acrylophosphonic acid according to one of claims 1 to 4, **characterized in that** the radical Z is unsubstituted or is substituted by =O, =S, $=NR^2$ or $-NR^3-CO-C(=CH_2)CH_2-Y-R^1-PO(OH)_2$.

6. Use of the acrylophosphonic acid according to claims 1 to 5 as a component of an adhesive, of a polymer, of a composite, of a cement, of a molded article and in particular of a dental material.

7. Use according to claim 6, **characterized in that** the dental material is a dental adhesive, a fixing cement or a filling composite.

8. Use according to claim 6 or 7, **characterized in that** the acrylophosphonic acid is present in at least partially polymerized form.

9. Dental material, **characterized in that** it contains an acrylophosphonic acid according to claims 1 to 5.

10. Dental material according to claim 9, **characterized in that** it contains the acrylophosphonic acid in at least partially polymerized form.

11. Polymers and copolymers, **characterized in that** they can be obtained by polymerization or copolymerization of an acrylophosphonic acid according to one of claims 1 to 5.